

REMARKS

In the Office Action, the Examiner rejected claims 22-53. By this paper, Applicants amended claims 22, 32, 40, 44, 46, 48 and 50-53 for clarification of certain features to expedite allowance of the present application. These amendments do not add any new matter. Upon entry of these amendments, claims 22-53 will be pending in the present application and are believed to be in condition for allowance. In view of the foregoing amendments and the following remarks, Applicants respectfully request reconsideration and allowance of all pending claims.

Interview Summary

The Applicants' representative, Nathan E. Stacy (Reg. No. 52,249) initiated an interview with Examiner Brandon Fetterolf on November 27, 2007 to discuss the Office Action of August 31, 2007. Prior to the interview, Applicants' representative provided two references to the Examiner. These references were (1) Long, E.C. and Barton, J.K. "On demonstrating DNA Intercalation," Accounts of Chemical Research 23 (1990), pp. 271-273 (hereinafter "Barton") and (2) Lerman, L. S., J. Mol. Biol. 3 (1961), pp. 18-30. These references are included in the accompanying Information Disclosure Statement filed under 37 C.F.R. § 1.97(c).

In the interview, the Examiner agreed that the references adequately clarified that one skilled in the art would understand the meaning of the term "intercalating moiety" at the time of filing of the application. However, the Examiner was still not convinced that the phrase "configured to insert into the structure of deoxyribonucleic acid" as recited by claims 22 and 32 was adequately descriptive. As discussed below, Applicants believe that the current amendments made to claims 22 and 32 clarify the meaning of this phrase and make the rejection moot.

Further, the Examiner agreed that Toner et al. (WO 93/21957, hereinafter "Toner") showed backside substituents on the ring structure, which may prevent intercalation, but felt that the provided references did not eliminate the possibility that substituted rings having smaller substituent groups, e.g. one or two methyl groups, could intercalate between the base pairs of DNA. The Examiner agreed that the addition of a structural limitation could be helpful, but asked to see the specific claim language prior to making any final decision on the allowability of the claims.

Finally, the Examiner agreed that a terminal disclaimer did not have to be provided immediately, but pointed out that waiting could delay the allowance of an application. To expedite prosecution of the application, Applicants have included the terminal disclaimer with this response.

Claim Rejections under 35 U.S.C. § 112, Second Paragraph

The Examiner rejected claims 22-39, 43-48 and 50 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Legal Precedent and Guidelines

The examiner's focus during examination of claims for compliance with the requirement for definiteness of 35 U.S.C. 112, second paragraph, is whether the claim meets the threshold requirements of clarity and precision, not whether more suitable language or modes of expression are available. *See* M.P.E.P. § 2173.02. Although the Examiner may take exception to the terms used in the claims, the patentee may be his own lexicographer. *Ellipse Corp. v. Ford Motor Co.*, 171 U.S.P.Q. 513 (7th Cir. 1971), *aff'd*. 613 F.2d 775 (7th Cir. 1979), *cert. denied*, 446 U.S. 939 (1980). The Applicant may use functional language, alternative expressions, negative limitations, or any style of expression or format of claim which makes clear the boundaries of the subject matter for

which protection is sought. *See* M.P.E.P. §§ 2173.01 and 2173.05; *In re Swinehart*, 439 F.2d 10, 160 U.S.P.Q. 226, (CCPA 1971). The Examiner is also reminded not to equate breadth of a claim with indefiniteness. *In re Miller*, 441 F.2d 689, 169 U.S.P.Q. 597 (CCPA 1971).

The essential inquiry pertaining to the definiteness requirement is whether the claims set out and circumscribe a particular subject matter with a reasonable degree of clarity and particularity. *See* M.P.E.P. § 2173.02. As set forth in Section 2173 of the Manual of Patent Examining Procedure, definiteness of claim language must be analyzed, not in a vacuum, but in light of:

- (A) The content of the particular application disclosure;
- (B) The teachings of the prior art; and
- (C) The claim interpretation that would be given by one possessing the ordinary level of skill in the pertinent art at the time the invention was made.

In reviewing a claim for compliance with 35 U.S.C. 112, second paragraph, the examiner must consider the claim as a whole to determine whether the claim appraises one of ordinary skill in the art of its scope and, therefore, serves the notice function required by 35 U.S.C. 112, second paragraph, by providing clear warning to others as to what constitutes infringement of the patent. *See Solomon v. Kimberly-Clark Corp.*, 216 F.3d 1372, 1379, 55 U.S.P.Q.2d 1279, 1283 (Fed. Cir. 2000). Only when a claim remains insolubly ambiguous without a discernible meaning after all reasonable attempts at construction must a court declare it indefinite. *See Metabolite Labs., Inc. v. Lab. Corp. of Am. Holdings*, 370 F.3d 1354, 1366, 71 U.S.P.Q.2d 1081, 1089 (Fed. Cir. 2004). Accordingly, a claim term that is not used or defined in the specification is not indefinite if the meaning of the claim term is discernible. *See Bancorp Services, L.L.C. v. Hartford Life Ins. Co.*, 359 F.3d 1367, 1372, 69 U.S.P.Q.2d 1996, 1999-2000 (Fed. Cir. 2004).

Rejection of Claims 22-39, 43-48 and 50 under 35 U.S.C. § 112, Second Paragraph

In rejecting claims 22-39, 43-48 and 50 the Examiner stated that the phrase “the intercalating moiety is configured to insert into the structure of deoxyribonucleic acid” recited in claims 22 and 32 is a relative term which renders the claim indefinite. Office Action, p. 2. Applicants respectfully disagree with the Examiner.

As stated in Barton, “DNA binding agents tend to interact noncovalently with the host molecule through two general modes . . . (ii) through an intercalative association in which a planar, hetero-aromatic moiety slides between the base pairs.” Barton, p. 271. The authors point out that “[s]ince its proposal by Lerman in 1961 as a mode of DNA binding by planar aromatic molecules, the physical effects and characteristics of intercalation on DNA structure have been well studied.” *Id.* It should be noted that Barton predates the filing of the present application, January 1, 2004, by nearly 14 years.

Accordingly, one of ordinary skill in the art would understand the term “intercalating moiety” and, thus, the scope of the claims as written. Furthermore, as noted in the Interview Summary, the Examiner agreed that the references adequately showed that the term “intercalating moiety” would have been understood by one of ordinary skill in the art at the time of filing.

However, the Examiner was unsure that the phrase “the intercalating moiety configured to insert into the structure of deoxyribonucleic acid” was adequately descriptive. As discussed with reference to the rejection under 35 U.S.C. § 102 below, Applicants have amended the claims reciting this phrase to claim structural details of the intercalating moiety. For example, claims 22 and 32 have been amended to recite, *inter alia*, “the intercalating moiety comprises at least one unsubstituted aromatic ring that shares two carbons with only one other aromatic ring, and is configured to insert into the structure of deoxyribonucleic acid.” This limitation specifically refers to an intercalating moiety having a single, unsubstituted aromatic ring fused to only one other aromatic ring

and which is capable of inserting between the base pairs of a DNA sequence. As stated in the application, “[t]he intercalating moiety is preferably an aromatic molecule with an intercalative binding affinity for double-stranded DNA.” Specification, para [0010]. The amendment is supported by Figs. 2 and 3 of the present application which show examples of the type of aromatic ring structure used, with the intercalating moiety labeled.

Applicants believe that the added limitation adequately clarifies the phrase “configured to insert into the structure of deoxyribonucleic acid” as recited by claims 22 and 32, making the rejection moot. Thus, Applicants respectfully assert that claims 22 and 32, and their respective dependent claims 23-31, 33-39, 43-48 and 50 are allowable and request that the Examiner withdraw the rejections under 35 U.S.C. § 112, second paragraph.

Claim Rejections under 35 U.S.C. § 112, First Paragraph

The Examiner also rejected claims 51-53 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. The Examiner asserted that claims 51-53 introduced new matter into the application.

In rejecting claims 51-53, the Examiner stated that “the limitation ‘chemical moiety’ has no clear support in the specification and the claims as originally filed.” Office Action, p. 3. Thus, the Examiner stated that this was new matter and required cancellation or written support. *Id.* Applicants respectfully disagree with the Examiner, noting that one of ordinary skill in the art would likely interpret the term “chemical moiety” to be a generic term having a meaning similar to “chemical compound.” However, to expedite prosecution, Applicants have amended claims 51-53 to recite a “tumor seeking molecule” as stated in the application. Specification, para. [0010]. Accordingly, Applicants believe the rejection to be moot and respectfully request that the Examiner withdraw the rejection and allow claims 51-53.

Claim Rejections under 35 U.S.C. § 102

In the Office Action, the Examiner rejected claims 22-24, 26-29, 32-37 and 40-53 under 35 U.S.C. § 102(b) as being anticipated by Toner as evidenced by Albert et al. (U.S. Patent No. 5,776,894, hereinafter “Albert”). Applicants respectfully traverse this rejection.

Legal Precedent and Guidelines

Anticipation under section 102 can be found only if a single reference shows exactly what is claimed. *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 227 U.S.P.Q. 773 (Fed. Cir. 1985). For a prior art reference to anticipate under section 102, every element of the claimed invention must be identically shown in a single reference. *In re Bond*, 910 F.2d 831, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990). To maintain a proper rejection under section 102, a single reference must teach each and every limitation of the rejected claim. *Atlas Powder v. E.I. du Pont*, 750 F.2d 1569 (Fed. Cir. 1984). Accordingly, the Applicants need only point to a single element not found in the cited reference to demonstrate that the cited reference fails to anticipate the claimed subject matter. The prior art reference also must show the *identical* invention “*in as complete detail as contained in the ... claim*” to support a *prima facie* case of anticipation. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 U.S.P.Q. 2d 1913, 1920 (Fed. Cir. 1989).

Toner Does Not Disclose an Unsubstituted Aromatic Ring Fused to Only One Other Aromatic Ring.

Turning now to the claims, independent claims 22, 32, 40 and 51 have been amended to recite, *inter alia*, “at least one unsubstituted aromatic ring that shares two carbons with only one other aromatic ring.” As discussed with respect to the rejection under 35 U.S.C. § 112, second paragraph, examples of these types of structures are provided in Figs. 2 and 3, which clearly label the multi-ring aromatic systems as the intercalating agents.

In contrast to claims 22, 32, 40 and 51 of the present application, Toner teaches a "metal radionuclide ion, a complexing agent which is pyridine, bipyridine, terpyridine, quarterpyridine, quinquepyridine, sexipyridine, or phenanthroline, and an immunnoreactive group covalently bonded through a protein reactive group to the complexing agent." Toner, p. 6, ll. 14-16. However, Toner does not disclose an intercalating moiety having a single, unsubstituted aromatic ring fused to only one other ring. *See, e.g.*, Toner, pp. 41-60, structures 71-98.

Thus, Toner does not disclose all of the limitations of independent claims 22, 32, 40 and 51, and cannot anticipate these claims. For the same reason, Toner cannot anticipate claims 23, 24, 26-29, 33-37, 41-50, 52 and 53, which depend from claims 22, 32, 40 and 51. Accordingly, Applicants respectfully request that the Examiner withdraw the rejections of the claims under 35 U.S.C. §102, and allow the claims to issue.

Claim Rejections under 35 U.S.C. § 103(a)

The Examiner rejected claim 25 under 35 U.S.C. § 103(a) as being unpatentable over Toner in view of Albert. Further, the Examiner rejected claims 30-31 and 38-39 under 35 U.S.C. § 103(a) as being unpatentable over Toner in view of Holley et al. (Cancer Research 1992; 52: 4190-4195, hereinafter "Holley"). Applicants respectfully traverse these rejections.

Legal Precedent

The burden of establishing a *prima facie* case of obviousness falls on the Examiner. *Ex parte Wolters and Kuypers*, 214 U.S.P.Q. 735 (PTO Bd. App. 1979). In addressing obviousness determinations under 35 U.S.C. § 103, the Supreme Court in *KSR International Co. v. Teleflex Inc.*, No. 04-1350 (April 30, 2007), reaffirmed many of its precedents relating to obviousness including its holding in *Graham v. John Deere Co.*, 383

U.S. 1 (1966). In *Graham*, the Court set out an objective analysis for applying the statutory language of §103:

Under §103, the scope and content of the prior art are to be determined, differences between the prior art and the claims at issue are to be ascertained, and the level of ordinary skill in the pertinent art are to be resolved. Against this background the obviousness or non-obviousness of the subject matter is to be determined. Such secondary considerations as commercial success, long-felt but unresolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. *KSR, slip op.* at 2 (citing *Graham*, 383 U.S. at 17-18).

Traditionally, to establish a *prima facie* case of obviousness, the CCPA and the Federal Circuit have required that the prior art not only include all of the claimed elements, but also some teaching, suggestion, or motivation to combine the known elements in the same manner set forth in the claim at issue. *See, e.g., ASC Hospital Systems Inc. v. Montifiore Hospital*, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984) (holding that obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention absent some teaching or suggestion supporting the combination.); *In re Mills*, 16 U.S.P.Q.2d 1430, 1433 (Fed. Cir. 1990) (holding that the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. Accordingly, the first test for obviousness is whether the prior art references, either alone or in any sort of hypothetical combination, contain all of the elements of the present claims.

Toner and Albert, taken alone or in hypothetical combination, fail to teach or suggest features recited by independent claim 22 and its dependent claims (including claim 25).

Turning to the claims, independent claim 22 recites, *inter alia*, “the intercalating moiety comprises at least one unsubstituted aromatic ring that shares two carbons with only one other aromatic ring.” As discussed with respect to the rejection under 35 U.S.C. § 102, Toner does not teach or suggest this limitation.

Further, Albert does not, either alone or in any sort of hypothetical combination with Toner, teach or suggest that “the intercalating moiety comprises at least one unsubstituted aromatic ring that shares two carbons with only one other aromatic ring.” In contrast, Albert teaches a somatostatin peptide linked to a chelating group. Albert, col. 1, ll. 38-39. While Albert does disclose aryl groups in the bridge between the chelating agent and the peptide, these single aromatic rings have very large groups attached to each side, which would prevent them from intercalating into a DNA backbone. *See* Albert, Examples 7-11. Further, no chelating groups disclosed in Albert have fused aromatic rings. *See* Albert, col. 5, l. 58-col. 8, l. 4. Thus, neither Toner nor Albert, either alone or in any sort of hypothetical combination, provides all of the limitations of independent claim 22.

As noted in the legal precedent section, the first test for obviousness is whether the references, alone or in any sort of hypothetical combination, disclose all the limitations of the claim. Accordingly, independent claim 22 is allowable over Toner in view of Albert. As claim 25 depends from claim 23 which depends from claim 22, it is allowable for the same reasons as claim 22. Thus, Applicants respectfully request that the rejection under 35 U.S.C. § 103 be withdrawn and claim 25 be allowed to issue.

Toner and Holley, taken alone or in hypothetical combination, fail to teach or suggest features recited by independent claims 22 and 32 and their dependent claims (including claims 30-31 and 30-39).

Turning to the claims, both independent claims 22 and 32 recite, *inter alia*, “the intercalating moiety comprises at least one unsubstituted aromatic ring that shares two carbons with only one other aromatic ring.” As discussed with respect to the rejection under 35 U.S.C. § 102, Toner does not teach or suggest this limitation.

Further, Holley does not, either alone or in any sort of hypothetical combination with Toner, teach or suggest that “the intercalating moiety comprises at least one unsubstituted aromatic ring that shares two carbons with only one other aromatic ring” and

cannot obviate the deficiencies of Toner. In contrast, Holley discloses a chlorambucil and a chlorambucil-spermadine combination. Holley, fig. 1. These compounds do contain a single aromatic ring, but large substituents in opposing positions would prevent the aromatic ring from intercalating into the backbone of a DNA. *Id.* Further, no groups disclosed in Holley have fused aromatic rings, and, thus, neither Toner nor Holley, either alone or in any sort of hypothetical combination, provides all of the limitations of claims 22 and 32.

Accordingly, independent claims 22 and 32 are allowable over Toner in view of Holley. As claims 30 and 31 depend from claim 22 and claims 38 and 39 depend from claim 32 they are allowable for the same reasons. Therefore, Applicants respectfully request that the rejection under 35 U.S.C. § 103 be withdrawn and claims 30, 31, 38 and 39 be allowed to issue.

Claim Rejections under Doctrine of Obviousness-Type Double Patenting

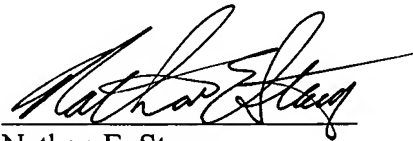
In the Office Action, the Examiner rejected claims 22 and 32 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 6,844,425, which is the parent of the present continuing application. Although Applicants do not necessarily agree with the Examiner's assertion, to expedite prosecution, Applicants have included a terminal disclaimer with the present response. Accordingly, Applicants respectfully request that the Examiner withdraw the obviousness-type double-patenting rejection.

Conclusion

Applicants respectfully submit that all pending claims should be in condition for allowance. However, if the Examiner believes certain amendments are necessary to clarify the present claims or if the Examiner wishes to resolve any other issues by way of a telephone conference, the Examiner is kindly invited to contact the undersigned attorney at the telephone number indicated below.

Respectfully submitted,

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